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## **Cryogenic Thermal Modeling and Experimental Validation of Termination System for Helium Gas Cooled Superconducting DC Cable**

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The Florida State University has recently completed a successful demonstration of a helium gas cooled superconducting DC cable system. Terminations are critical elements of a superconducting cable system. The terminations for the gas cooled superconducting cable are particularly challenging due to lower dielectric strength and heat capacity of helium gas compared to those of liquid nitrogen. The termination system used in the demonstration contained some novel design concepts to mitigate the challenges. Thermal models were used to assess the heat loads from the terminations. Experiments were carried out and thermal map of the system was obtained at various helium gas mass flow rates. Experimental results were compared with those of the model. It was observed that the model describes the heat loads from various sections. The paper will describe the design of the terminations and comparison of the results of the thermal models and experiments. This work was supported by the Office of Naval Research (ONR).

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